

EMBRYOLOGY

Eggs of Opossum Photographed To Show Earliest Life Stages

Natural Selection Shown at Work, Eliminating "Unfit" at Fertilization and During Early Growth

See Front Cover

EGGs OF a very primitive type of mammal, the common American opossum, have been studied and photographed by Dr. Carl Hartman and his associates of the Department of Embryology, Carnegie Institution of Washington, in their Baltimore laboratory. They have succeeded in obtaining these early life stages at several points of development, from unfertilized and just-fertilized eggs to the earliest divisions of the body into the beginnings of nervous system, muscles, etc.

It takes trained eyes and critical searching to find the eggs in their first, unfertilized state. They are then only about the size of poppy or tobacco seed, and of just about the same color as the much-wrinkled walls of the uterus, or reproductive cavity, into which they have been discharged from the ovaries. Yet careful hunting succeeds in locating them, and equally careful gathering methods get them out.

Architectural Outline

Immediately after fertilization by the spermatozoa, the eggs enlarge rapidly to several times their original diameter, and become somewhat clearer in appearance. They are then said to be in the primary vesicle stage.

On the surface of the vesicle appears a scarcely visible white line or streak. It is caused by a thickening or condensation of the living, actively growing protoplasm, and is known as the primitive streak. It is a sort of architectural chalk-line, showing where future building is to take place, for it marks the site where the new animal's body will begin to develop.

One of the most interesting of Dr. Hartman's photographs shows a group of 22 cells at this early stage of development. Seven of them have been fertilized and have grown normally; four, though fertilized, show dwarfed or retarded growth; eleven remain unfertilized and show no growth or development at all.

Dr. Hartman cites this as a case of

natural selection at work even before birth. The eleven unfertilized eggs apparently lack some necessary factor of vitality from their very formation. They are the wholly unfit, and will come to nothing. They are life-seeds that fall by the wayside.

The four eggs that are fertilized but fail to grow normally represent genetic stock that "has something"—but not enough. It is doubtful whether they will develop into young animals at all; more likely they, too, will die before birth and their substance be resorbed into the parent's body.

The seven that have been normally fertilized and have grown to full size stand a good chance of coming to birth as young opossums. Seven would not be an extraordinary litter for an opossum. But even part of these may not come through. Thus death lies in wait for life even before we are born—for this same kind of natural waste goes on before birth in all animals, including ourselves.

A later-stage photograph in Dr. Hartman's collection is even more striking,

though taken at a considerably lower magnification. It shows, as he says, "the eggs in the basket they came in;" for it is a picture of the uterus of one of the animals opened, showing the vesicles, increased in size, each bearing the recognizable beginnings of body structures.

To be sure, these objects, shown in higher magnification in a third photograph, do not look at all like even the youngest opossums. Garden slugs are about the only familiar animal form they at all resemble, and that resemblance is only of the faintest and most superficial sort. Yet opossums they will become, for they bear within themselves the still mysterious substances or forces that constitute biological predestination toward 'possumhood.

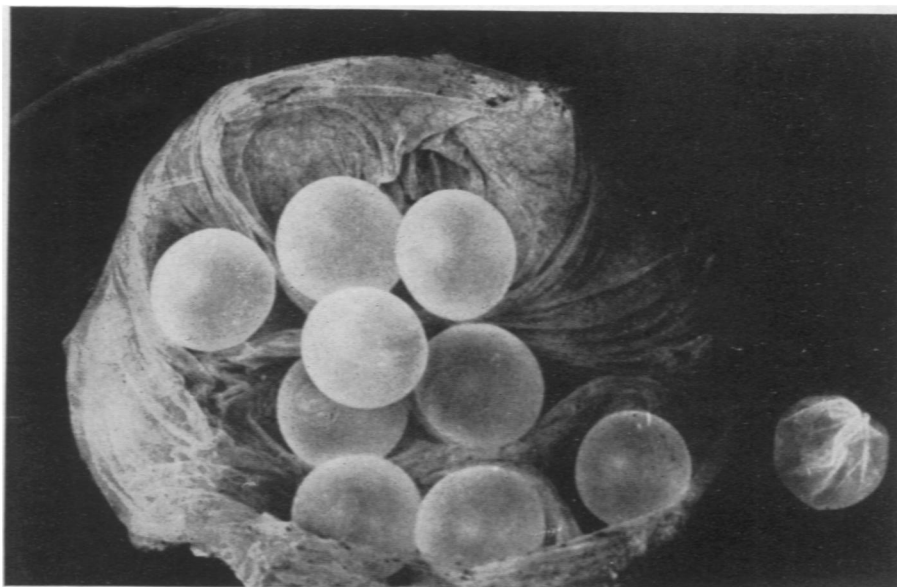
Science News Letter, July 10, 1937

ASTRONOMY

Major Disturbance Due On Planet Jupiter

A GREAT disturbance on the planet Jupiter to occur during the next few months was predicted in a communication to the American Association for the Advancement of Science from Dr. E. C. Slipher of Lowell Observatory, Flagstaff, Ariz. It will take the form of a series of intense dark spots in the giant planet's equator. A small faint marking gives warning of the approaching spots, judging from a similar event in 1920.

Radio communication over long dis-



"IN THE BASKET THEY CAME IN"

Female opossum's uterus, cut open to show a number of the eggs, each with an embryo in very early developmental stage.